

## REMARKS

The holding of allowable subject matter is gratefully acknowledged.

### Specification

The specification has been amended to correct two obvious typos. These changes are purely pedantic and do not relate to the scope or understandability of the application.

### Art rejections

The art rejections are respectfully traversed.

Since the references are many and/or complex, Applicants will confine their remarks to those portions of the references cited by the Examiner, except as otherwise indicated. Applicants make no representation as to the contents of other portions of the references.

### Independent claims 1, 8 & 15

Claim 1 recites:

A system for transferring a known infinity homography, comprising:

an image processor processing an image sequence, wherein the image processor:

selects an image pair from the image sequence, the selected image pair including one of two images to which the known infinity homography applies and an additional image; and

derives an infinity homography for the selected image pair from the known infinity homography.

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Against this claim the Examiner first cites Shasua. Applicant respectfully submits that the Examiner misconstrues Shasua.

The Examiner says that Shasua shows deriving a homography for a selected image pair from the known homography. For this proposition, the Examiner cites col. 6, line 65 through col. 7, line 12 (in bold italics below). The entire paragraph of col. 6, line 50 through col. 7, line 12 is reproduced from the PTO data base as follows:

With this background, the operations performed by the image analyzer module module 14 in accordance with one aspect of the invention will be described in connection with FIG. 3. With reference to FIG. 3, the image analyzer module 14 initially generates the coordinates of the epipoles  $v$  and  $v'$  in their respective image planes .psi.1 and .psi.2 as described above (step 100). The image analyzer module 14 uses the coordinates of the epipoles and the coordinates of the projections of three corresponding points  $P_j$ ,  $j=1,2,3$  onto the two image planes .psi.1 and .psi.2 (the projections being designated  $p_j$  and  $p'_j$ ,  $j=1,2,3$ , respectively) to generate entries of the matrix comprising the homography  $A_{sub.1}$  by satisfying  $A_{sub.1} p_{sub.j} \text{ congruent } p_{sub.j}'$  and  $A_{sub.1} v \text{ congruent } v'$  (step 101), and repeats the operation with projections of another set of points  $P_j$  to generate entries of the matrix comprising homography  $A_{sub.2}$  (step 102). *The image analyzer module 14 may use, as the set of points for generating homography  $A_{sub.2}$ , a set that overlaps the set used for generating homography  $A_{sub.1}$ , that is, if it uses projections of points  $P_j$ ,  $j=1,2,3$ , in generating homography  $A_{sub.1}$ , it can use projections of points  $P_{j,j=2,3,4}$ , in generating homography  $A_{sub.2}$ .*

This paragraph corresponds to the background information discussed in the opening section of the present application. In each case, homographies are calculated from pairs of image planes and epipoles. The section in bold italics says nothing different. It only says that the points used for generating one homography can also be used in generating a second homography. Applicants do not see that this section says that one homography is used in generating another.

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The Examiner cites Torr col. 6, lines 60-64 as a "call for infinity homography." This section says:

As can be appreciated by one of ordinary skill within the art, such a rectification process involves determining the  $H_{sub\infty \sup 1j}$ , which is the homography of the plane at infinity between the first image and the  $j$ th image.

While this section mentions infinity homography, it fails to teach or suggest how such a homography is to be determined, or indeed how to do any calculation at all. Accordingly, this section is at best an invitation to invent, and cannot be used to supplement any other information about calculation.

Applicant accordingly respectfully submits that the Examiner has failed to make a *prima facie* case of obviousness against claim 1.

Independent method claim 15 and independent system claim 8 contain limitations analogous to those discussed above with respect to independent claim 1.

**Claim 2, 9 & 16**

This claim recites:

The system according to claim 1, wherein the image processor, in deriving the infinity homography for the selected image pair, determines intermediate transfer parameters for a homography for the selected image pair.

Against this claim, the Examiner cites col. 5, lines 20-36 of Shasua. These lines say:

The value of  $\kappa$ , for each point  $P$  in the scene will remain unchanged (that is, invariant) regardless of the location of point  $O$ , and therefore under any projective transformation of the scene, that is, under any rigid transformation of the scene followed by scaling, stretching, shearing and mapping of regular points onto points at an infinite distance. Accordingly, in this manner, the conventional representation of shape, that is, the depth of each point  $P$  in a scene

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relative to the center of projection of the recording device(s), is replaced with the projective representation  $\kappa$ , which, as follows from equations Eqn 2 and Eqn. 3, is determined for each point P only from its projections p and p' in the image planes  $\psi_1$  and  $\psi_2$ . These projections do not depend on the recording device being calibrated, since changing the intrinsic parameters of the recording device introduces a projective transformation of the images recorded thereby, with respect to which  $\kappa$  is invariant, as described above.

Applicant has reviewed this text and fail to find any intermediate transfer parameters that could be useful in deriving an infinity homography. Homographies at infinity are much more difficult to calculate than arbitrary homographies.

Applicant accordingly respectfully submits that the Examiner has failed to make a *prima facie* case against claim 2.

Claims 9 & 16 contain limitations analogous to those discussed above with respect to claim 2.

The Examiner's other rejections and/or points of argument not addressed would appear to be moot in view of the following. Nevertheless, Applicants reserve the right to respond to those rejections and arguments and to advance additional arguments at a later date.

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Applicant respectfully submits that the application is accordingly in condition for allowance. Allowance is therefore respectfully requested.

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